Original Articles.

FEEDING IN TYPHOID FEVER, WITH A REPORT OF CASES.

BY GEORGE W. MOOREHOUSE, M.D.,
Resident Physician to the Lakeside Hospital, Cleveland, O.

At a meeting of the Cleveland Medical Society, held December 8, 1899, the writer presented a paper[1] with the above heading detailing the experience of the Lakeside Hospital for a period of eight months in the use of a more generous diet in the treatment of typhoid fever than is the usual practice. During that time there were 40 available cases out of a total in the hospital of 57 individuals with typhoid fever. Five of the cases died, a mortality of 8.8%; death was due in 2 cases to toxemia, and in 3 to perforation, and all of these had been kept, from the time of entrance to death, on milk diet. There were no deaths in the series of 35 who were fed early. There was a total of 11 relapses in 57 individuals, or 19%.

In seventeen months of the writer's service in this hospital, March 1, 1899, to July 31, 1900, 150 individuals with typhoid fever have been discharged from the hospital, including the 57 individuals of the first report, and it is the purpose of this paper to consider the effect of early feeding in typhoid fever on the basis of this experience.

In addition to precautions designed to prevent the spread of the disease to other patients and to the attendants, the general treatment and management of cases of typhoid may be very briefly told. Their mouths and throats are kept clean by the use of sprays and mouth washes, and they are guarded so far as is possible from unnecessary exertion. The temperature is taken every three or four hours, and when above 102.5° F. a tub bath is given. The initial temperature of the bath is 85° F., and this is reduced in proportion to the temperature of the patient, but not usually below 68° F. An initial dose of calomel is given to about one-half the cases; later, enemata are relied upon to relieve constipation until well along in convalescence, except that in the service of one of the visiting physicians calomel in doses of $\frac{1}{6}$ grain three times daily, combined, if this does not prove effectual, with podophyllin, usually in the dose of $\frac{1}{10}$ grain, is not infrequently employed. In another service the use of some of the commoner mild laxatives in case of a sudden exacerbation of temperature in convalescence, or even during the latter part of defervescence in case of constipation, has been frequent. For tympanites turpentine stupes and enemata with turpentine were used with satisfaction; in the same condition an emulsion of turpentine was given to a few patients, but with so little apparent good effect that its use was not extensive. Other than the above there has been very little medication unless stimulation seemed necessary. Alcohol, usually in the form of whiskey, was the stimulant most frequently used, and it is probable that a large proportion of all patients who were sick enough to demand any considerable number of baths received some alcohol in the course of the disease. Strychnia takes second place in the list of stimulants. Next to strychnia strong coffee was a not infrequent order, 4 ounces every four hours, and in a certain class of cases, particularly those with well-marked apathy, it gave very striking and gratifying results. Digitalis was used in one or two desperate cases. In patients with profound toxemia, infusions of salt solution were used a few times, and this is a procedure that deserves, in the opinion of the writer, a more thorough trial than it has yet been given. As the general condition of the patient improved after entrance, frequent inquiries were made as to the return of the appetite, and when that was noted, soft typhoid diet was ordered, usually at once without direct reference to the temperature. With a return of the appetite, however, the temperature was almost invariably falling. At times a patient might be hungry very shortly after complaining of severe abdominal pain, or after having had a hemorrhage from the bowel, or while the temperature was still very high, and in such cases the feeding would very likely be withheld for a time. In the original paper, I say: "Furthermore the appetite and not the temperature has been made the guide to the continuance and to the increase of the diet once begun, and a number of patients went through an entire relapse without any decrease in the diet, the appetite holding good during the entire time." This statement is true to a great extent in the entire series, although the writer has, a little more frequently than before, ordered the patient back on to a milk or other liquid diet on the occurrence of a rise of temperature, to see what effect it might have on the subsequent course of the fever. This procedure, however, has in no case seemed to cut it short in any way. On the other hand, in cases with persistent anorexia, associated with a falling temperature, the visiting physicians have manifested a disposition to tempt the appetite of the patient by ordering the larger variety of the soft typhoid diet.

As to sitting up, the general rule was that the patient must have been for 10 days with a normal temperature, and, in view of the tendency of a typhoid's temperature to become subnormal after the febrile period has passed and to remain so for a considerable length of time, a normal temperature with reference to the first propping up in bed was interpreted as one which never reached a higher level than 98.6° F. In case the temperature varied within practically normal limits, but frequently reached 99° or 99.5° F., the first bedrest was postponed for a time, usually to the end of the second week of such temperature.

In December, after the first eight months' experience, a series of typhoid diets was adopted at the Lakeside Hospital, for the purpose of simplifying the orders for patients with typhoid fever, and as an aid in making their care uniform throughout the hospital. The diets adopted are as follows:

Milk diet. — The standard for a milk diet shall be 8 ounces every two hours, subject to special directions as to night feedings. Watch stools for undigested milk. Report and record failure to take full amount.

Liquid typhoid diet. — In twenty-four hours: Milk, 8 ounces four times; milk, 6 ounces with tea or coffee, $\frac{1}{2}$ to 1 ounce twice; albumin water, 8 ounces twice; beef tea, 8 ounces once; malted milk, 8 ounces once; chicken broth and barley water, each 3 ounces once; beef juice and barley water, each 3 ounces once. Those liquids which are to be given only once in twenty-four hours may be replaced by equivalent amounts of any of the following: Broths, milk-whey, slip, junket, strained soups or gruels.

[1] Cleveland Journal of Medicine, vol. v., No. 2, February, 1900.

Soft typhoid diet. — Add to the liquid or milk diet: (1) Ice cream, well-cooked rice (boiled), broths may be thickened with it; (2) soft boiled or poached egg on soft toast, blanc mange and milk puddings, calf's foot and other gelatine jellies; (3) gruels, crackers or bread softened in milk or broths, macaroni, finely minced and scraped meats. The increase in diet to be very gradual, one addition the first day, two the second, etc., scraped beef on the fourth or fifth day.

Typhoid convalescent diet. — Add to anything already given the following in about the order mentioned. Soft parts of oysters, a tender sweetbread, chop, squab,[2] game (small),[2] chicken, fish, cutlet, steak, rare roast beef. Mealy baked potato may be given with any of the meats.

Full typhoid diet. — SIX A. M., milk; 8 A. M., breakfast, a cereal with cream and a small amount of sugar if desired, milk with tea or coffee, egg on toast, bread or toast with butter if desired; 10 A. M., bread and butter, with gruel or milk, or broth with egg; 11.30 A. M., dinner, soup which may be thickened, some meat, as chop, or cutlet, or fish, or steak, or roast beef, or the soft parts of oysters, or sweetbreads,[2] or squab,[2] or small game,[2] mealy baked potato, or rice, or macaroni, or sphaghetti, with a simple dessert, as ice cream, or blanc mange, or milk pudding; 2 to 3 P. M., like 10 A. M.; 4 to 4.30 P. M., supper, creamed chicken, or a bit of cold meat, as chicken or roast beef, bread, and milk flavored with tea or coffee; 6 P. M., cocoa or gruel or broth. At night, milk two to four times.

These directions are furnished with the diet lists. Any change from a less to a more generous diet must be gradual. The between-meal feedings of liquids are important as limiting the amount of solid food taken at one time, their importance increasing in proportion to the earliness of the order for the generous diet.

The writer does not claim the merit of originality for the above diets and, except for the greater certainty that he will be understood in the article, would not report them. The liquid typhoid diet and the soft typhoid diet are modelled on the lines of diets he was acquainted with in his medical service at the Massachusetts General Hospital in Boston. The full typhoid diet is an adaptation to conditions prevailing with us of the diet used by Dr. Bushuyev[3] and while it may seem that the meals recur with great frequency, one or two feedings used by that observer have been omitted from this schedule.

The standard liquid diet has been milk, for Dr. Fitz's[4] study of the subject seems to show that the mortality on a milk diet is somewhat less than that on other liquid diet. On the relatively rare occasions when milk was very repugnant to the patient the liquid typhoid diet was ordered, and still more rarely milk was wholly omitted from the bill of fare. In such cases the change to a more liberal diet was made as promptly as possible. Full typhoid diet was added to this list for the sake of completeness at the time of the adoption of the other typhoid diets, and in view of its possible use in case any of the physicians to the hospital should desire to begin the use of solids at a very early stage of the disease; furthermore it was designed as a possible variant to the convalescent typhoid diet. Its use has not been extensive.

During seventeen months from March 1, 1899, to July 31, 1900, 150 cases of typhoid fever have been discharged from the Lakeside Hospital. Of this number 33 are not reported, while 117 are reported. With regard to the cases not reported, 3 were given soft diet so late that they may be said to have been on a liquid diet for the usual length of time. In 5 cases the diagnosis is not absolutely assured; in all of these the course of the fever while the patients were under observation in the hospital was mild and short, and with one exception the Widal reaction was never obtained. Had the reaction been obtained in the 4 cases which did not show it they would be considered certain though mild cases of typhoid fever. The case in which it was obtained had been a soldier during the Spanish-American War, and while in camp in the United States had been sick with "malaria," and it was impossible to decide with any certainty from the history given for the previous illness that it had not been typhoid. While in the hospital he had a slight fever and dysenteric evacuations of the bowels. The subsequent history of another doubtful case is known and the length of time which elapsed before the patient fully recovered her normal strength makes the diagnosis of typhoid very probable. Either from a continuance of the liquid diet to the usual time in convalescence, or on account of such a departure from the routine procedure as regards diet here described, 11 private cases are not included in the report of feeding. One case became dissatisfied and was discharged against advice a few days after entrance on a milk diet. One case while still on a milk diet perforated, was operated upon and recovered. Twelve cases died before any change from milk, 8 of toxemia and 4 of perforation;[5] 1 case, to be mentioned in detail below, was changed from milk to soft diet before the temperature was normal, had a relapse, was again put on milk diet, nine days later perforation, operation, death.

One hundred and seventeen cases were given soft typhoid diet before or very shortly after the temperature became normal.

The report in the first paper considered only one change of diet to each patient fed early. When, however, we consider the second orders of soft diet for those patients who, on account of a return of the fever, were put back on milk diet, and each increase in diet ordered early in convalescence, we have a much larger number of diet changes upon which to base our conclusions. The following statements show the sequences to diet orders, except those from a more to a less liberal diet, and are 174 in number or, excluding those twice counted, 159.

CLASS I*a*. Feeding on normal[6] temperature, followed by slight irregularities of temperature, 5 cases:

Soft	diet on	second	day of	normal	temperature, 2 cases.
"	"	fourth	"	"	1 case.
Convalescent	"	first	"	"	1 case.[7]
"	"	second	"	"	1 case.[8]

[2] Used only for private ward patients.

[3] See Thayer in Progressive Medicine, vol. i.

[4] Typhoid Fever at the Massachusetts General Hospital during the Past Seventy-eight Years, Boston Medical and Surgical Journal, vol. cxli, No. 21.

[5] One gave no Widal reaction on repeated trials. An autopsy, however, demonstrated the correctness of the clinical diagnosis.

[6] With reference to feeding, any day's temperature is considered normal when its highest rise is 99° F. or below, provided that the temperature of previous days give reasonable assurance that it will not go above that point.

[7] In this case the greatest rise, to 100° F., occurred after bedrest.

[8] Temperature (sub)normal eleven days before a relapse; relapse-like rise of seven days' duration occurred ten days after feeding was begun; patient did not seem sick; spleen palpable for the first time in the illness.

CLASS I*b*. Feeding on normal temperature; no subsequent rise, 39 cases:

Soft diet on first			day of normal temperature			.	5 cases.
"	"	second	"	"	"	.	5 "
"	"	third	"	"	"	.	1 case.
"	"	fourth	"	"	"	.	4 cases.
"	"	fifth	"	"	"	.	3 "
"	"	seventh	"	"	"	.	1 case.
"	"	eighth	"	"	"	.	1 "
"	"	ninth	"	"	"	.	1 "
Convalescent diet on			second day of normal temperature,				2 cases.
"	"	third	"	"	"		4 "
"	"	fourth	"	"	"		3 "
"	"	fifth	"	"	"		2 "
"	"	sixth	"	"	"		2 "
"	"	seventh	"	"	"		1 case.
"	"	eighth	"	"	"		2 cases.
"	"	tenth	"	"	"		1 case.
House	"	fifth	"	"	"		1 "

CLASS II*a*. Feeding before normal temperature, followed by relapse-like rise of temperature, 21 cases:

						Cases.		Duration.
Soft diet, relapse (?)			begins at once,			4	.	8, 11, 13 and 14 days.
"	"	"	in	2 days,		1	.	15[9] "
"	"	"	"	4 "		1	.	27 "
"	"	"	"	7 "		2	.	10 and 10 "
"	"	"	"	8 "		1	.	5 "
"	"	"	"	9 "		1	.	11(*b*)[10] "
"	"	"	"	10 "		1	.	10[11] "
"	"	"	"	11 "		2	.	4 (*b*), 21 (*b*) "
"	"	"	"	12 "		1	.	10 (*b*)[12] "
"	"	"	"	15 "		1	.	3 (*b*) "
"	"	"	"	17 "		1	.	13 (*b*) "
"	"	"	"	21 "		1	.	8 (*b*) "

					Cases.		Duration.
Convalescent diet, relapse (?)			begins at once		1	.	16 days.
"	"	"	"	in 11 days	1	.	7 (*b*) "
"	"	"	"	" 20 "	1	.	7 (*b*) "
Full	"	"	"	at once	1	.	17 "

CLASS II*b*. Feeding followed by slight or irregular fever not thought to be relapse, 13 cases.

	Cases.
Irregular temperature subsequent to feeding is continuous with similar temperature previously	12
Irregularity occurs after ten days of normal temperature and is associated with anemia and bedrest	1

CLASS II*c*. Defervescence apparently unaffected by food, 84 cases:

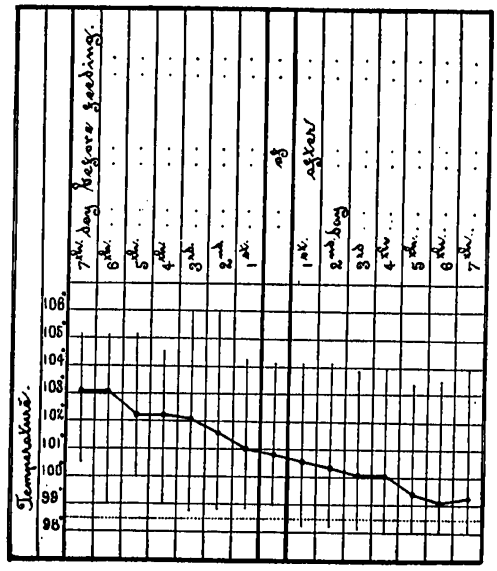
								Cases.
Soft diet, lysis undisturbed								60
"	"	"	until increase of diet			7 days after		1
"	"	"	"	"	"	27 "		1
"	"	"	"	"	"	42 "		1 (*b*)
"	"	"	8 days, relapse (?) of			5 days' duration		1
"	"	"	9 "	"	"	11 "	"	1
"	"	"	16 "	"	"	10 "	"	1
"	"	"	11 "	"	"	4 "	"	1
"	"	"	11 "	"	"	22 "	"	1 (*b*)
"	"	"	12 "	"	"	10 "	"	1
"	"	"	15 "	"	"	3 "	"	1
"	"	"	17 "	"	"	13 "	"	1
"	"	"	21 "	"	"	8 "	"	1
"	"	"	14 "	then irregular temperature				1[13]
"	"	"	22 "	"		"		1[14]

	Cases.
Convalescent diet, lysis undisturbed	6
" " " 11 days, followed by relapse (?) of 7 days' duration	1 (*b*)
Convalescent diet, lysis undisturbed, 20 days, followed by relapse (?) of 7 days' duration	1[15]
House diet, lysis undisturbed	2

CLASS II*d*. Defervescence apparently hastened by feeding, 11 cases.

I have frequently been asked regarding the degree of fever present when these patients were first fed. This interesting question is answered as to the patients who were fed before the temperature became normal in the following chart, which shows the average[16] highest temperature on the day of feeding and for seven days preceding and following that event. It also indicates the extreme range of *highest* temperature for the same day in the vertical line. None but the highest temperatures for the day are considered. The highest point in the line shows the highest temperature for the day of that patient whose temperature registered the highest, the lowest point of the line shows the highest temperature of the day for the patient whose temperature registered the lowest.

The total number of deaths in the series was 13. All were on a milk diet at the time of death, but 1 had been put on soft diet on the twenty-sixth day of the disease, with a very moderate appetite and a temperature which ranged from 99° to 101.5° F. His next day's temperature did not rise above 100.5° F. and in the morning touched normal. From that point on the temperature gradually ascended. On the fifth



day of soft diet the notes say that the appetite was good, an increase in the appetite coincident with the increasing elevation of temperature. On the evening of the sixth day of the feeding the temperature was 102.8° F.; the next morning, the seventh day of the feeding and the thirty-third of the disease, his temperature was 100° F.; the appetite remained good to fair, but he was ordered back onto milk diet; for the succeeding nine days his temperature remained quite steadily high. Nine days after the order for soft typhoid diet had been changed to one for milk he perforated, was operated upon, but did not recover. In the remaining 11 cases death occurred in from seven to fifteen days from the time of entrance while still on a milk diet. Thirteen deaths in 150 cases gives a mortality of 8.67%. What the mortality of this series would have been had they been limited to a milk diet for from seven to ten days after the temperature had reached normal, as they should have been to conform to the teaching of the usually ac-

[9] Relapse continued to perforation.

[10] Certain cases are twice counted as to their behavior subsequent to a single diet order; all such are marked (*b*) in the place where they were thought *less* properly to belong.

[11] Elevation of temperature continued to discharge of patient "against advice," before the completion of defervescence.

[12] Elevation of temperature associated with phlebitis.

[13] Patient unruly, got out of bed.

[14] Irregular temperature, associated with anemia and bedrest.

[15] Discharged "against advice," before defervescence was completed.

[16] Average is used throughout this paper as the more familiar and convenient term. In no instance, however, is it the average which is used, but the mean which varies a little from the average, and is usually considered the more reliable and significant unit for the expression of the range of any series of values. The mean in this case is that temperature which has an equal number of temperatures lower and an equal number higher than itself.

cepted authorities, it is impossible to conjecture, nor have we here any series kept uniformly on milk diet with which to compare these results.

It is possible, however, to find a moderate amount of evidence in the literature of typhoid which bears on this question. In 1897 Dr. Shattuck[17] reported that, from 1886 to 1893, he had had under his care at the Massachusetts General Hospital, 233 cases of typhoid fever treated with a milk diet, with a mortality of 10%, and that from 1893 to 1897, 147 had been treated with a more liberal diet, with a mortality of 8.1%. Dr. R. H. Fitz[18] in a very interesting article on typhoid fever at the same hospital for the past seventy-eight years, covering the whole period during which typhoid fever has been differentiated from typhus in this country, gives later figures on the same subject. According to this article, Dr. Shattuck's mortality from 1893 to 1898 was 11.3%, as compared with that of 15.1% among patients using largely a milk diet.

The most interesting experience in the liberal feeding of typhoid patients which has come to my notice is that of a Russian army surgeon. An abstract of the original report is given by Thayer in his article on typhoid fever in the first volume of "Progressive Medicine." The entire number of patients with typhoid fever entering the hospital with which Dr. Bushuyev was connected, 154 in all, were divided, as equally as possible, between him and a colleague. The patients of the latter, 74 in number, received the treatment common in that hospital, and this included as to diet two litres of milk and one or two soft boiled eggs in the day. Dr. Bushuyev's patients, 80 in number, at entrance were put upon a liberal diet, very similar to the one described earlier under the name of "full typhoid diet." In a small number of cases he was unable to get the patient to take solid food, and when this was the case he was put on a milk diet, and Dr. Bushuyev called it forced feeding. The forced feeding was discontinued as soon as possible. The statistical results are interesting, but Dr. Bushuyev does not profess to be able to draw any very positive conclusions from so small a number of cases. The general mortality was 10% on the liberal, and 12.1% on the milk diet. The average duration of the fever after entrance was 18.9 days for those liberally fed, and 22.3 days for those on milk.[19] The average stay in the hospital was forty-two days for those liberally fed, and 49.2 for the others; this represents a gain to the hospital of one year, two hundred and eleven days for a single patient. Of the patients liberally fed only 8.3% were discharged incapable of duty, but of those who were kept on a milk diet 15.4% were so discharged. Of the patients who died, the average day of death was the twenty-eighth of the disease for the patients liberally fed and the twenty-sixth for those on milk.

The objection of those who fear to give solid food early to patients with typhoid fever on account of its supposed liability to cause either hemorrhage or perforation seems to be that the food by mechanical irritation may in some way cause either one or the other of these serious accidents. In no case in the 117 given soft diet, most of them when the temperature had still a considerable daily range, as may be seen by reference to the chart, did we have intestinal hemorrhage as a sequel. The only case in which intestinal perforation was a sequel to feeding has been described at length above and it is hard to see how anything in the list of "soft typhoid diet" could mechanically have caused perforation of the intestine nine days after the return to milk diet.

The status of the question of the relation of feeding to relapse is quite different, and is one not altogether easy to settle. In this series the writer will report 30 relapse-like rises of temperature, 9 before and 21 after feeding, a total of 20% of relapses to 150 patients, or 18% of relapse after feeding in the 117 fed early. Either 18 or 20% of relapse is a somewhat higher proportion than the highest usually reported, and is about twice as high as the percentages most commonly reported. The writer feels confident that he has included among the cases of relapse a considerable number that would not have been so classified by others. There are several reasons for this belief. Osler[20] says that "a relapse is a repetition, sometimes only a summary of the original attack, and that two of the three important symptoms — step-like temperature at onset, roseola and enlarged spleen — should be present to determine the diagnosis of a relapse." The records on these cases are not in all respects satisfactory, in that negative examinations have not always been recorded; however, in 6 of the cases in which it is stated that a relapse occurred after feeding there is some indication, positive or nearly so, that in the relapse the spleen was increased in size as compared with the days just previous to the relapse; in about the same number we are able to say that there is no discoverable increase in size of the spleen or fresh eruption of the rose rash. About the remainder the writer is unable to state with positiveness in view of the silence of the histories on the points in question, but in many, possibly in a majority, of these cases, negative examinations were made but not recorded. In the matter of the temperature we are not in doubt; all had the step-like elevation of temperature. In the table, when speaking of the duration of a relapse, the time is counted as including the first day on which the temperature reached 99° F. in its rise, when that took place from a normal level, to the last day on which it reached the same point; on this most generous basis of counting the duration of a relapse we have them of only five, four and three days' duration. Another reason why it seems probable that rises of temperature which have not usually been called relapse are here included is that in all but one or two cases they have seemed very mild. There has been one death in relapse and this, in the 30 instances which have been called relapse, is a mortality of 3.3%. Hare[21] reports from the literature a mortality of 9.1% in 252 cases of relapse.

There are some other interesting questions which may be considered with reference to the possible relation between feeding and relapse which will be very little affected by the possible incorrectness in the diagnosis of the condition, provided only that the same considerations have determined in each instance whether a given rise of temperature shall or shall not be called a relapse, and this is the case. It is probably

[17] Diet in Typhoid Fever. Journal of the American Medical Association, vol. xxix, p. 51, 1897.

[18] Typhoid Fever at the Massachusetts General Hospital during the Past Seventy-eight Years, Boston Medical and Surgical Journal, vol. cxli, No. 21.

[19] The average duration of the fever after entrance in our series was eighteen to nineteen days.

[20] Practice of Medicine.

[21] Medical Complications and Sequelæ of Typhoid Fever.

true that the usual arguments against early feeding in typhoid fever, so far as they refer to the occurrence of a relapse, would lead one to believe that if feeding in the manner detailed is a cause of relapse and is therefore "improper feeding" such relapse is to be expected immediately upon the issuance of the order for the more generous diet. The chart, which shows the average highest temperatures in the patients who were fed before normal temperature on the day of the first feeding, and for one week before and one week after that time, a total of fifteen days, indicates very clearly that feeding does not interrupt the defervescence.

The important features in these diet lists are two, the articles permitted, and the directions for the increase in diet, ensuring the gradualness of any increase from a less to a more generous diet level, but the new level was fully reached in the average case in about four to five days, whether it was a change from milk to soft or from soft to convalescent diet. There were in the entire number fed 117, 159 orders increasing the diet at a stage of the disease early enough to make it seem advisable to report them, and in only 10 of these cases, 6.3% of all instances of increase of diet, was there any irregularity of temperature which could have been called a relapse within a period of seven days from the time of the increase in the diet; 11 more, or 6.9%, had the step-like rise of temperature in from eight to twenty-one days after the order increasing the diet, a total of 13.1% of relapse at any period after increase of diet, while no such change occurred in 138, the remaining instances.

The average stay in the hospital on a milk diet has been ten days; the average time elapsing from the first order increasing the diet to an order for the patient to be propped up in bed with a bedrest was eighteen days. These two events divide the first twenty-eight days of the average patient's stay in the hospital into two convenient periods. In the first 9 relapses occurred, and in the second there were 21. Since "the true relapse usually sets in after complete defervescence," [22] and since the defervescence is not completed until after the end of the first period, it would scarcely need the fact of feeding at the beginning of the second period to explain the greater number of relapses taking place in it.

There are certain items of interest which have been observed in the course of treatment of these cases which do not lend themselves to statistical statement. There has been no trouble in patients with typhoid fever receiving food surreptitiously. They are kept in wards with patients suffering from other diseases, but neither from their mates in the ward nor from their friends do they receive food not allowed, and this with only ordinary watchfulness on the part of the nurses. Complications may or may not influence perceptibly the temperature of a patient with typhoid fever. Phlebitis often does; in 2 cases with marked phlebitis there has been a step-like rise of the temperature, coinciding in the onset with the occurrence of the phlebitis, resembling in every way the temperature of a relapse, and these cases have been counted as relapses although no enlargement of the spleen and no fresh eruption of the rose rash was detected. Menstruation has, in one or two instances, apparently caused a rise of temperature in convalescence, but has frequently failed to produce any disturbance. Earlier in the paper the fact that at the apparent completion of defervescence the temperature at times fails to become (sub)normal, but ranges almost indefinitely at from 97° to 99° or even 99.5° F was mentioned. This is so uniformly the case with patients who are unruly and cannot be induced to lie quietly in bed, but jump around, prop themselves up on their elbows, etc., that we are confident that restlessness is a very certain cause for such irregularities in temperature. In the same connection it may be interesting to note that a patient who has had the subnormal temperature that is to be expected in convalescence will have a temperature that goes up to 99° F or higher when he first gets up. Ordinarily one looks upon this as a return of the temperature to the normal range, but in such cases the quieter a patient is kept the lower will be the temperature, and the true cause of the greater range is probably to be found in exertion in advance of complete recovery of strength. The greatest instability of temperature seems to be found in patients with the most considerable degree of post-typhoidal anemia and the poorest general condition. There have been three or four patients in the series who have entered much below par, and while gaining on generous diet, have not gained as the majority of patients do; in these cases we have been confronted by an elevation of temperature every time the patients have been allowed to sit up, and when they have been sent back to bed again the temperature has dropped to subnormal at once. In general the condition of patients who are being fed is very satisfactory, they begin to put on flesh at once, and show a continuous gain in strength and spirits as well as in flesh. It is possible that patients fed a little less early would be more manageable, for these feel so very well that it is often hard to keep them quiet. A fair proportion of all the cases have been heard from since discharge, and they usually report themselves as having returned to their ordinary employment shortly after discharge, and as never having felt better, the inference being that as regards recovery of normal condition liberal feeding is a distinct advantage, and I think that I may make this statement as voicing the impressions of the visiting staff.

The conclusion that a more generous diet in typhoid fever is advisable will be made or rejected after a consideration of its effects upon mortality, upon the general condition of the patient both during the progress of the disease and after his discharge from the care of the physician, and furthermore as to whether it increases the chances of hemorrhage, perforation, or relapse. Whatever information is given on these points by this series of 150 cases of typhoid fever treated in the course of seventeen months is here presented for your consideration.

The writer wishes to thank the visiting physicians to the hospital for the opportunity to feed these patients early, as well as for permission to report the cases.

[22] Practice of Medicine.

A CITY PLAGUE LABORATORY. — The New York City Board of Health, at a recent meeting, awarded a contract for the building of the laboratory for the study of the bubonic plague on the Willard Parker Hospital grounds. The cost of the building will be $19,893. The laboratory is to be built in three months. — *Medical Record.*